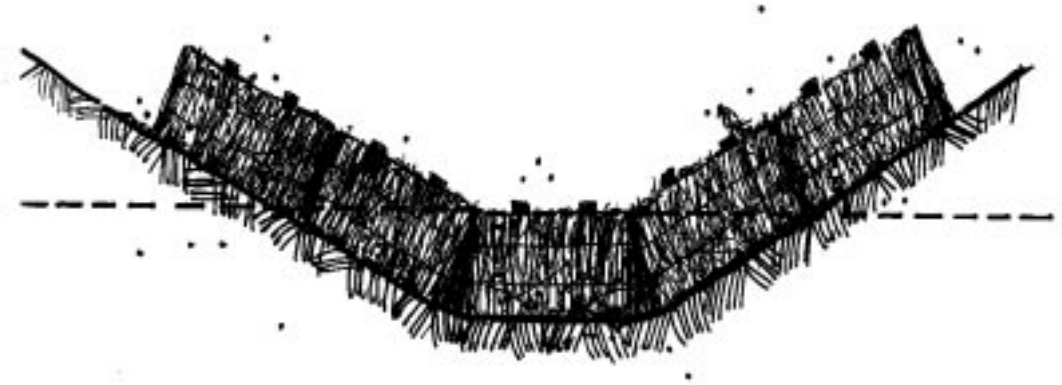
PRIMARY USE: Erosion control and sediment detention.
ADDITIONAL USES: Decrease the velocity of flow from a site.

STRAW BALE BARRIER

What is it? A temporary sediment barrier consisting of a row of entrenched and anchored rice, or wheat straw bales.

Purpose

To intercept and detain small amounts of sediment from disturbed areas of limited extent in order to prevent sediment from leaving the site. To decrease the velocity of sheet flows and low-to-moderate level channel flows.



Location of Straw Bale Barrier in Swale
Section View

Limitations

Because straw bale barriers are not designed to withstand high pressure heads, the drainage area must be restricted and the barrier located so that the water depth does not exceed 1.0 ft (305 mm) at any point. Do not install straw bale barriers across streams, ditches, or where flows are concentrated. It is not recommended to use a straw bale barrier across a swale or ditch. Usually a silt fence or other BMP would better address erosion and sediment problems in this case. The design life of straw bale barriers is three months or less. Improper use of straw bale barriers has been a major problem. Straw bale barriers have been used in streams and drainage ways where high water velocities and volumes have destroyed or impaired their effectiveness. Improper placement and installation of the barriers, such as staking the bales directly to the ground with no soil seal or entrenchment has allowed undercutting and end flow. This has resulted in additions instead of removal of sediment from runoff waters.

Materials

Rice, wheat, or straw bales.

Installation

Use this practice below disturbed areas subject to sheet and rill erosion where the size of the drainage area is no greater than 1/8 acre per 100 feet (0.05 hectare per 30 m) of barrier length and the maximum slope gradient behind the barrier is 3:1.

Source: NRCS Planning & Design Manual, NRCS.

STRAW BALE BARRIER

Sheet Flow Applications

Bales should be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. All bales should be either wire- bound or string- tied. Straw bales should be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales (in order to prevent deterioration of the bindings). The barrier should be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 in (102 mm). After the bales are staked, the excavated soil should be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 in (102 mm) against the uphill side of the barrier. Each bale should be securely anchored by at least two stakes or rebars driven through the bale. The first stake in each bale should be driven toward the previously laid bale to force the bales together. Stakes or rebars should be driven deep enough into the ground to securely anchor the bales. The gaps between bales should be chinked (filled by wedging) with straw to prevent water from escaping between the bales. (Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency). Straw bale barriers should be removed when they have served their usefulness, but not before the upslope areas have been permanently stabilized.

Excavate the trench. Place and stake bales.

Wedge loose straw between bales. Compact excavated soil.

Channel Flow Applications

Bales should be placed in a single row, lengthwise, oriented perpendicular to the channel, with ends of adjacent bales tightly abutting one another. The remaining steps for installing a straw bale barrier for sheet flow applications apply here, with the following addition. The barrier should be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale to assure that sediment-laden runoff will flow either through or over the barrier but not around it. (Note: See "Location of Straw Bale Barrier in Swale" for illustration on previous page).

Source: NRCS Planning & Design Manual, NRCS.